NEW INSIGHTS INTO THE STRUCTURE OF COAL AND COAL MACERALS. R. J. Pugmire, A. Soderquist, A. L. Beeler, and D. M. Grant, Departments of Fuels Engineering and Chemistry, University of Utah, Salt Lake City, Utah 84112.

The use of dipolar dephasing techniques has been demonstrated as a very useful probe into the details of the carbon skeletal structure of whole coals and coal maceral groups. The data thus obtained indicates that T_2 values observed in coals and coal macerals are comparable to those observed in model organic compounds with similar types of structural units. Hence, relative amounts of protonated and nonprotonated carbons can be obtained from detailed dipolar dephasing studies. These data also reveal the presence of a highly mobile phase in the aliphatic region of the spectra of low rank coals. A comparison of the skeletal structural units in low rank coals, liptinite, vitrinite, and inertinite maceral groups and variations within maceral groups separated by density gradient centrifugation techniques will be given.